

Recent U.S. Activities in Forensic Science: A NIST Update from John Butler

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NIST Disclaimer

Points of view are those of the author and do not necessarily represent the official position or policies of the US Department of Justice or the National Institute of Standards and Technology.

Certain commercial equipment, instruments and materials are identified in order to specify experimental procedures as completely as possible. In no case does such identification imply a recommendation or endorsement by the National Institute of Standards and Technology nor does it imply that any of the materials, instruments or equipment identified are necessarily the best available for the purpose.

This presentation does not include any information from the NIST Applied Genetics Group and research being conducted on forensic DNA

U.S. initiatives to strengthen forensic science & international standards in forensic DNA

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OPEN SOURCE
(freely available)

- This review article covers recent U.S. activities to strengthen forensic science including the formation of the National Commission on Forensic Science and the Organization of Scientific Area Committees
- DNA documentary standards and guidelines from organizations around the world are also included

NIST Forensic Science Efforts

National Commission on Forensic Science (NCFS)



Department of Justice FACA
co-led by NIST
setting policy

Organization of Scientific Area Committees (OSAC)



NIST-administered
>540 members of the community
establishing standards and best practices

Assessing
scientific
foundations
and method
validation for
select forensic
disciplines

NIST Funded Internal Research Programs



~\$7.5M/year
invested

NIST Forensic Science Center of Excellence



CoE: ~\$4M/year invested for
5 years (2015-2020)

International Symposium on Forensic Science Error Management



432 participants (11 countries)

MOU between DOJ and NIST

publicly available on the NCFS website

**MEMORANDUM OF UNDERSTANDING BETWEEN
THE DEPARTMENT OF JUSTICE
AND
THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
IN SUPPORT OF
THE NATIONAL COMMISSION ON FORENSIC SCIENCE AND THE
ORGANIZATION OF THE COMMITTEES**

X. Signatures:

For the Department of Justice:

Date: 4 August 2015

For the Institute of Standards and Technology:

Date: 05 August 2015

**This MOU expired on
April 23, 2017.
It primarily impacts the
NCFS charter, which was
not renewed by DOJ**

DOJ-NIST MOU (2013-2015; 2015-2017)

Section VI. B. National Institute of Standards and Technology:

NCFS

1. Will appoint a Senior NIST Official to serve as the Co-Chair of the Commission;
2. Will administer and coordinate all necessary support for the Scientific Area Committees, subject to the following provisions;

OSAC

- a. Scientific Area Committees have no authority to make decisions on behalf of either Party or the Commission and may not provide advice directly to the federal government, any federal agency or officer, or any other entity.
- b. Scientific Area Committees may collaborate with relevant voluntary standards development organizations or professional organizations for the development of consensus guidance before releasing their proposed guidance to the public.
- c. Scientific Area Committees do not report to the Commission and are not federal advisory committees in accordance with the Federal Advisory Committee Act, as amended, 5 U.S.C. App.2.

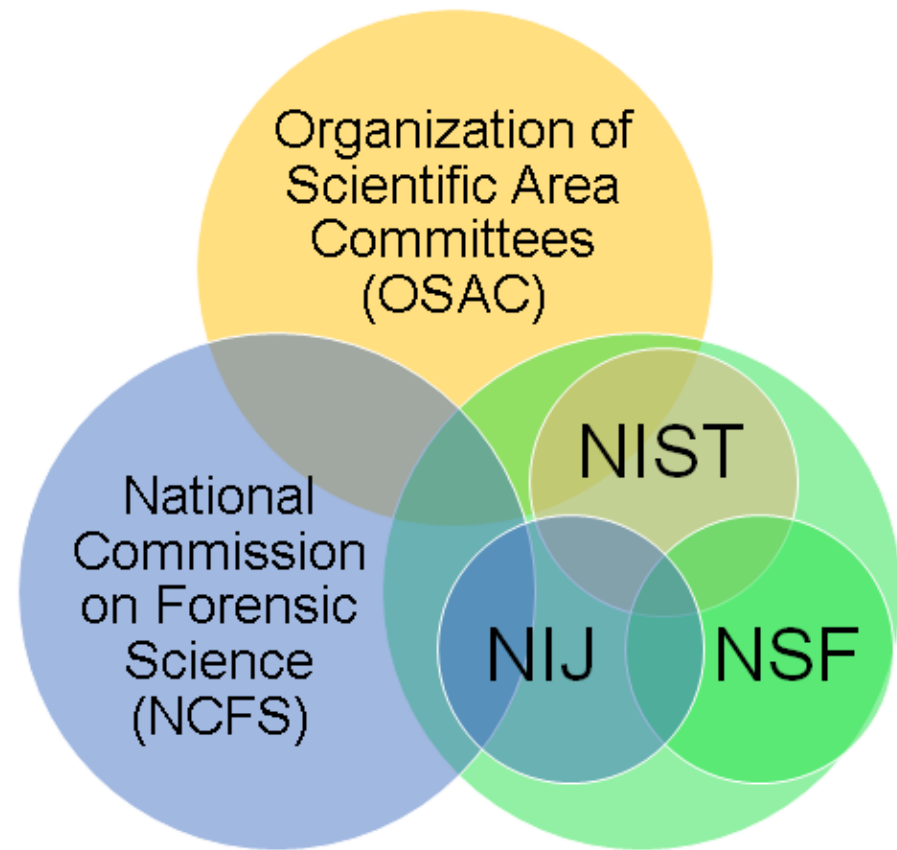
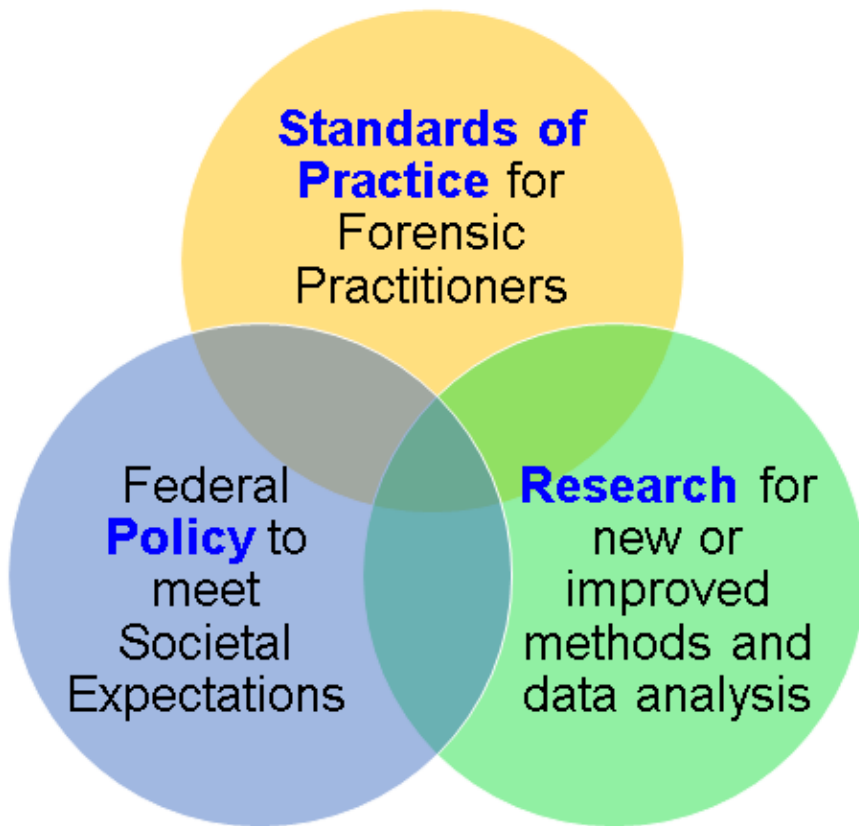
Research

3. Will conduct research supporting the development and dissemination of methods, standards, and technical guidance for forensic science measurements;

Validation

4. Will test and validate select existing forensic science practices and standards as appropriate.

Policy – Practice – Research are all inter-related



PCAST Report

President's **C**ouncil of **A**dvisors on **S**cience and **T**echnology

*a Federal Advisory Committee to the White House's
Office of Science and Technology Policy (OSTP)*

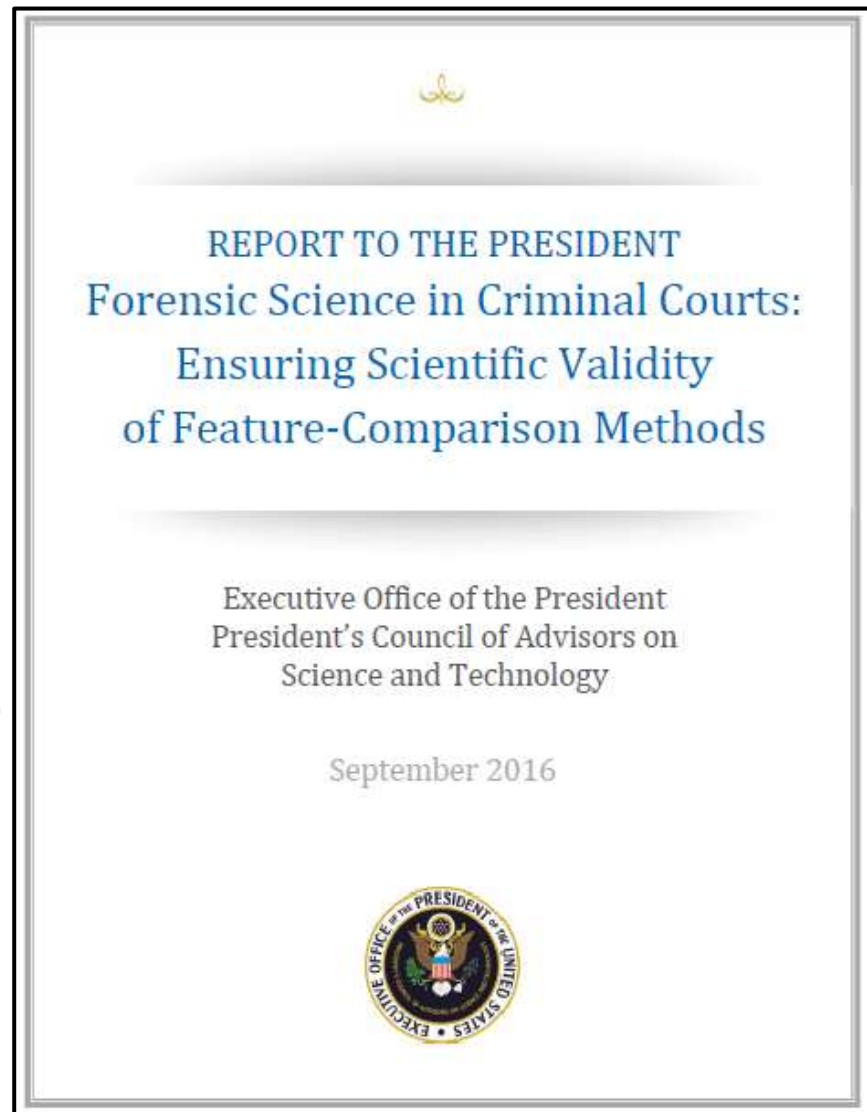
PCAST Report

Released September 20, 2016

Provides comments on:

- 5.1 DNA (single-source and simple-mixtures)
- 5.2 Complex DNA Mixtures
- 5.3 Bitemark Analysis
- 5.4 Latent Fingerprint Analysis
- 5.5 Firearms Analysis
- 5.6 Footwear Analysis
- 5.7 Hair Analysis

Provides recommendations to **NIST** and OSTP (§6), FBI Laboratory (§7), Attorney General (§8), and the Judiciary (§9)



PCAST Report Comments on Forensic DNA

Released September 20, 2016

- Supports appropriate use of single-source and simple mixture DNA analysis
- **Expresses reservations with complex DNA mixtures** (≥ 3 contributors)

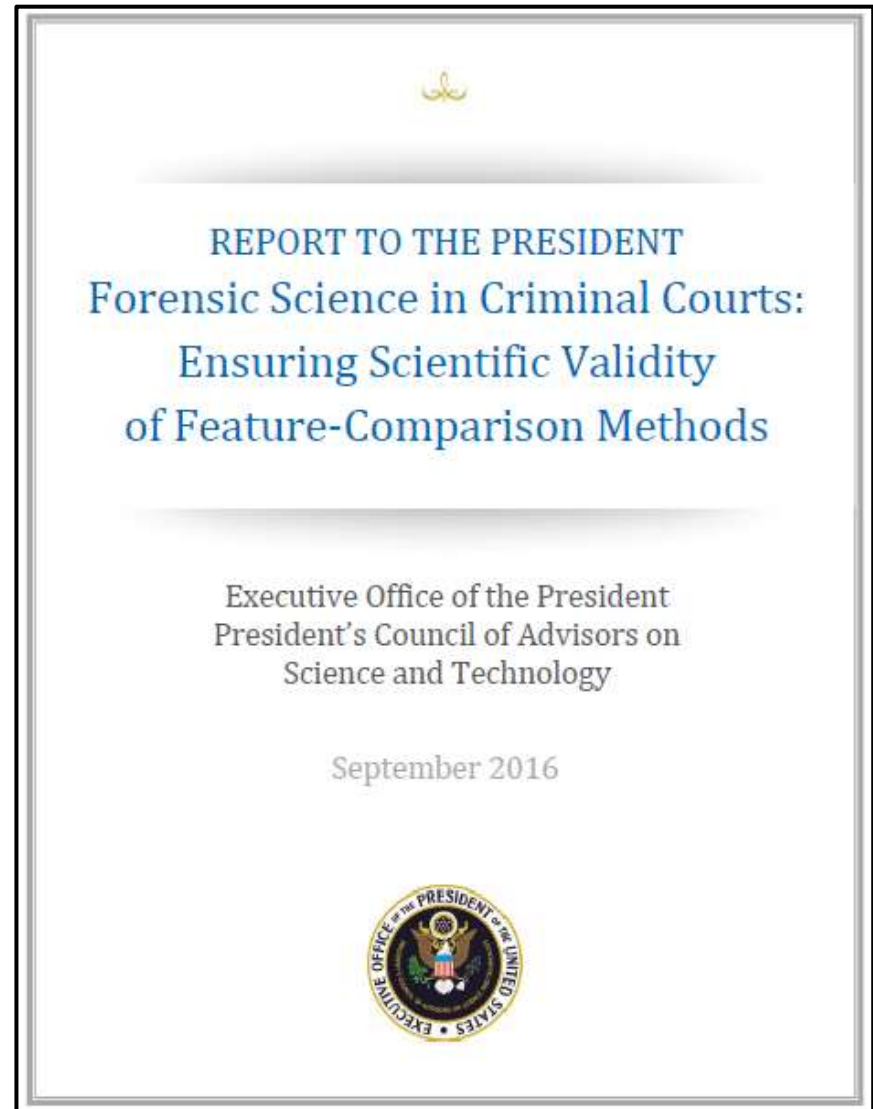
PCAST Co-Chairs



Eric Lander



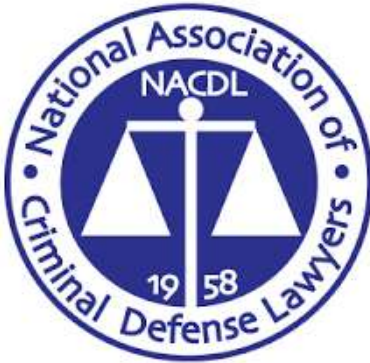
John Holdren



Responses to the PCAST Report



Sept 2 (2 pages)
Nov 16 (9 pages)



Sept 20 (2 pages)



Sept 21 (3 pages)



Sept 30 (2 pages)



Oct 31 (2 pages)



Sept 20 (1 page)



Sept 21 (2 pages)



Oct 5 (1 page)



International Association
for Identification

Sept 7 (1 pages)
Not dated (2 pages)

Articles published on Sept 20, 2016

The Washington Post

- **“A wake-up call on the junk science infesting our courtrooms”**
 - Harry T. Edwards and Jennifer L. Mnookin
- **“Calls for limits on ‘flawed science’ in court are well-founded: A guest post”**
 - Tom Jackman (with Brandon Garrett)
- **“White House science advisers urge Justice Dept., judges to raise forensic standards”**
 - Spencer Hsu

The Wall Street Journal – Sept 20, 2016

- **“White House Advisory Council Report Is Critical of Forensics Used in Criminal Trials”**
 - Gary Fields
- “In a statement, **Attorney General Loretta Lynch** said the Justice Department had taken unprecedented steps to strengthen forensic science, including investments in research, draft guidance to lab experts when they testify in court and ‘reviews of forensic testimony in closed cases.’
- “We remain confident that, when used properly, forensic science evidence helps juries identify the guilty and clear the innocent, and the department believes that the current legal standards regarding the admissibility of forensic evidence are based on sound science and sound legal reasoning,” Ms. Lynch said. **“While we appreciate their contribution to the field of scientific inquiry, the department will not be adopting the recommendations** related to the admissibility of forensic science evidence.”

ACFSL Position Statement

Attacks the authors and their connections to the Innocence Project



THE AMERICAN CONGRESS OF FORENSIC SCIENCE LABORATORIES



The United States Assembly of Forensic Science Laboratory Professionals

Our Mission

To represent and unite all current and former professionals of United States forensic science laboratories with the purpose of creating and preserving the conditions necessary for the American criminal and civil justice systems to have confidence in the integrity of forensic laboratory services.

The American Congress of Forensic Science Laboratories

c/o The Forensic Foundations Group
1231 Michigan Avenue, Suite 205
East Lansing, MI 48823
(517) 803-4063
office@forensicfoundations.com

POSITION STATEMENT

September 21, 2016

THE 2016 PCAST REPORT

The United States President's Council of Advisors on Science and Technology (PCAST) has released a report that portrays in an unfavorable light specific forensic science disciplines that are in common use today. ¹ Drawing the most pointed criticisms were:

<http://www.crime-scene-investigator.net/PDF/american-congress-of-forensic-science-laboratories-response-to-forensic-science-in-federal-criminal-courts-ensuring-scientific-validity-of-pattern-comparison-metho.pdf>

Additional Responses to PCAST

- David Kaye blog (multiple dates starting Sept 1)
 - <http://for-sci-law.blogspot.com/> (e.g., Oct 24 – “PCAST’s sampling errors)
- Geoffrey Morrison *et al.* (Oct 5)
 - Letter to the Editor of *Forensic Sci. Int.*
 - 18 co-authors including Simone Gittelson (NIST SED)
- Mark Perlin letter (Sept 16)
 - <https://www.cybgen.com/information/newsroom/2016/sep/files/letter.pdf>
- John Buckleton blog (Sept 1) and letters/emails
 - <https://johnbuckleton.wordpress.com/pcast/>
- **Several OSAC subcommittees have drafted responses...**

From a Recent Article by a Law Professor

Jessica Gabel Cino, Associate Dean for Academic Affairs and Associate Professor of Law, Georgia State University and member of the American Academy of Forensic Science's Standards Boards for DNA and fingerprints

- “Pattern identification evidence shouldn’t be excluded from cases wholesale, but forensic evidence needs to be placed into context. **When the human eye is the primary instrument of analysis**, the court, the attorneys and the jury should be fully aware that **certainty is unattainable, human error is possible, and subjectivity is inherent.**”
- **“The PCAST report is yet another wake-up call** for the criminal justice system to correct the shortcomings of forensic science. We demand that guilt be proven beyond a reasonable doubt; we should also demand accurate and reliable forensics. **Without improvement, we can’t trust forensic science to promote justice.**”

PCAST Report Requests for NIST

- Requests that NIST
 1. **perform foundational validity evaluations** and
 2. **issue an annual public report of findings**
- Recommends that Congress should increase NIST funds by **\$4 million for evaluation work** and **\$10 million for additional research**
- Asks NIST to work with the FBI Laboratory in conducting research and evaluations

Statement from the Acting NIST Director at the NCFS Meeting on April 10, 2017

- “This past September the President’s Council of Advisors on Science and Technology (PCAST) recommended an expanded role for NIST in assessing the scientific foundations and maturity of various forensic disciplines. We do recognize the need for, and value of, such studies and are exploring ways to conduct some work in this area. Without the additional funding recommended by PCAST, NIST cannot make any large-scale commitments to extensive technical merit review.
- “That said, **we are planning an exploratory study to address concerns raised by PCAST regarding complex DNA mixtures.** This will likely involve assessing the scientific literature, developing a detailed plan for evaluating scientific validity that would include probabilistic genotyping, and designing one or more interlaboratory studies to measure forensic laboratory performance with DNA interpretation. These interlaboratory studies would build upon previous NIST DNA mixture studies conducted in 2005 and 2013. NIST has a history of involving external partners in its research and standards efforts, and we anticipate external and international collaboration in this effort.”

National Commission on Forensic Science (NCFS)

*a Federal Advisory Committee to
the Department of Justice (DOJ)*

Media Coverage of the NCFS Closure

April 10, 2017



Sessions orders Justice Dept. to end forensic science commission, suspend review policy



U.S. Attorney General Jeff Sessions during the daily briefing March 27. (Jim Watson/AFP/Getty Images)

By Spencer S. Hsu April 10

Attorney General Jeff Sessions will end a Justice Department partnership with independent scientists to raise forensic science standards and has suspended an expanded review of FBI testimony across several techniques that have come under question, saying a new strategy will be set by an in-house team of law enforcement advisers.

April 11, 2017

The New York Times

The Opinion Pages | OP-ED CONTRIBUTOR

Sessions Is Wrong to Take Science Out of Forensic Science

By ERIN E. MURPHY APRIL 11, 2017

Prosecutors [applauded](#) the April 10 [announcement](#) by Attorney General Jeff Sessions that the Department of Justice was disbanding the nonpartisan National Commission on Forensic Science and returning forensic science to law enforcement control. In the same statement, Mr. Sessions suspended the department's review of closed cases for inaccurate or unsupported statements by forensic analysts, which regularly occur in fields as diverse as firearm and handwriting identification, and hair, fiber, shoe, bite mark and tire tread matching, and even fingerprinting analysis.

If all you knew about forensic science was what you saw on television, you might shrug off this news, believing that only the most sophisticated and well-researched scientific evidence is used to solve and prove crimes. But reality is different.

Comments on Media Coverage

- There have been several dozen articles in the news media covering the NCFS closure since DOJ made its announcement on April 10, 2017
 - **There are multiple agendas pushing narratives – so don't believe everything you read!**
 - When NCFS was created, it was expected to last 4 to 6 years
- NCFS was designed as a Federal Advisory Committee with a limited lifetime (renewed every two years)
 - Public meetings and documents (videos are available from meetings; see website: <https://www.justice.gov/ncfs>)
 - The Commission accomplished a number of useful things – see the NCFS Summary Report...

[NCFS Summary Report: Reflecting Back-Looking Toward the Future](#)

[NCFS Summary Report: Appendix A - National Commission on Forensic Science Commissioners and Biographies](#)

[NCFS Summary Report: Appendix B - National Commission on Forensic Science Subcommittees](#)

[NCFS Summary Report: Appendix C - National Commission on Forensic Science Recommendations and Views](#)

[NCFS Summary Report: Appendix D - National Commission on Forensic Science Public Comments](#)

Read the Actual Press Release from the Department of Justice on April 10, 2017

<https://www.justice.gov/opa/pr/attorney-general-jeff-sessions-announces-new-initiatives-advance-forensic-science-and-help>

“We applaud the professionalism of the National Commission on Forensic Science and look forward to building on the contributions it has made in this crucial field.”

The following three actions were announced today:

1. In the coming weeks, the Department will appoint a Senior Forensic Advisor to interface with forensic science stakeholders and advise Department leadership;
2. The Department will conduct a needs assessment of forensic science laboratories that examines workload, backlog, personnel and equipment needs of public crime laboratories and the needs of academic and non-traditional forensic science practitioners, and issue a report to Congress; and
3. The Department will [publish a notice in the Federal Register seeking public comment](#) on how the Department should move forward to strengthen the foundations of forensic science and improve the operations and capacity of forensic laboratories. The notice will remain open until June 9, 2017.

Contribute Your Thoughts on Future Needs in Forensic Science

- Written public comment regarding the issue for comment should be submitted through *www.regulations.gov* **before June 9, 2017.**
- <https://www.regulations.gov/document?D=DOJ-LA-2017-0006-0001>

February 3-4, 2014 was the first meeting of the **National Commission on Forensic Science**

40 Commissioners

32 voting and 8 ex-officio members

Selected from >300 applicants

Represent diverse backgrounds, extensive experience, and come **from 21 states**



- Professors of biochemistry, chemistry, pathology, physics, sociology, statistics, and law (including a National Medal of Science recipient)
- Crime laboratory directors
- Judges, prosecutors, and defense attorneys
- Sheriff, detective, coroner, medical examiner, victims' advocate, and defendants' rights advocate

National Commission on Forensic Science (NCFS)

www.justice.gov/ncfs

Policy-focused

NCFS Leadership

Until January 2017



Sally Q. Yates
Deputy Attorney General
DOJ Co-Chair



Willie E. May
Director of NIST
NIST Co-Chair



Nelson A. Santos
Vice-Chair (DOJ)



John M. Butler
Vice-Chair (NIST)

32 voting and 8 *ex-officio* members

Final meeting (13th): April 10-11, 2017

National Commission on Forensic Science

- Established in 2013 with an MOU between NIST and DOJ (MOU also enabled OSAC to start)
- NCFS is a Federal Advisory Committee to DOJ
- First meeting was held in February 2014
- In total, **13 meetings were held**
 - Meeting 11 was at NIST (September 12-13, 2016)
- Focus is on policy issues
- **43 documents** were approved
 - 20 recommendations and 23 views of the Commission
 - **A Summary Report was approved April 10, 2017**

NCFS Meeting Materials Available

<http://www.justice.gov/ncfs/meeting-materials.html>

Meeting Summaries

pdf document

National Commission on Forensic Science

Meeting Summary

May 12–13, 2014

Office of Justice Programs
810 7th Street NW, Washington, DC

Speaker Slides (pdf files)

2nd National Commission on Forensic Science Webcast

National Commission on Forensic Science Meeting...



Webcast
(>9 hours of
archived video)

MEETING TWO

References

Listing of 22 references provided to Commissioners

Human Factors and Cognitive Bias in Forensic Science

Deborah Boehm-Davis, Dean, College of Humanities and Social Sciences and University Professor, Department of Psychology, George Mason University

John Collins, President, Forensic Foundations Group

The Need for Sequential Unmasking

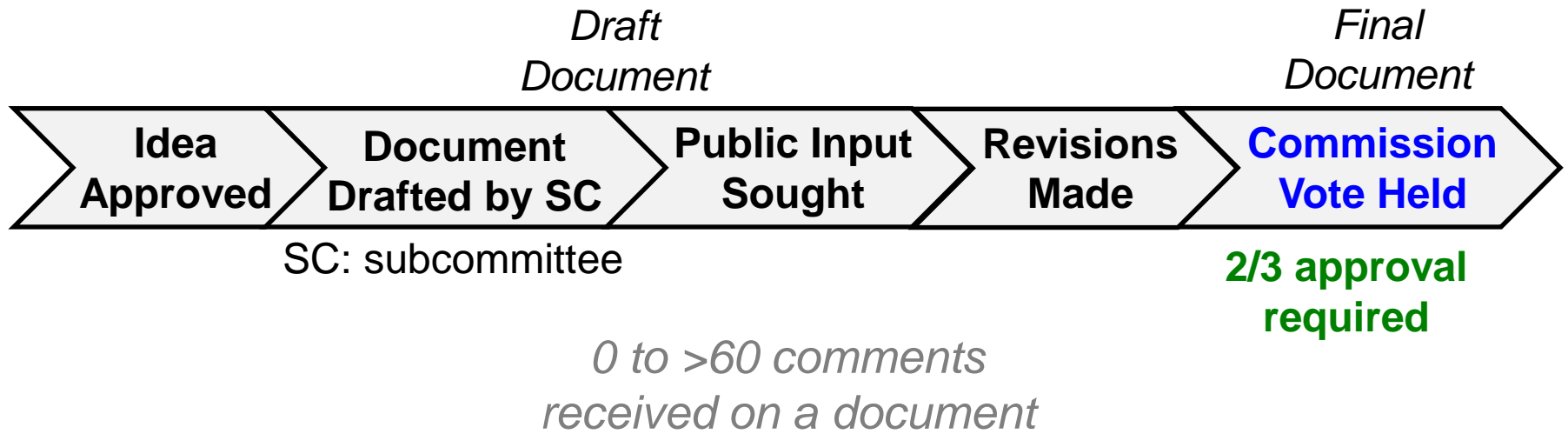
Michael Risinger, John J. Gibbons Professor of Law, Seton Hall University School of Law

David H. Kaye

Distinguished Professor of Law and Weiss Family Faculty Scholar, Penn State University, Dickinson School of Law



General Process for NCFS Document Development



**43 total documents approved
through meeting #13 (April 2017)**

Types of NCFS Work Products

43 total documents approved

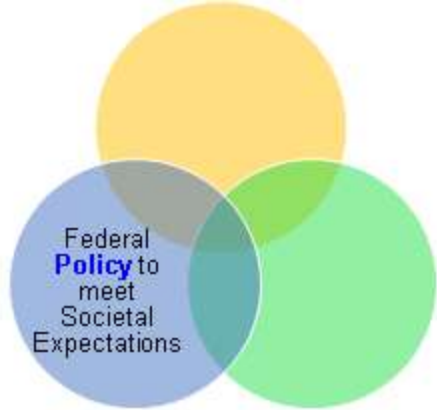
through meeting #13 (April 2017)

1) **Views** of the Commission

- **23 approved** (through Meeting #13, April 2017)

2) **Recommendations** to the Attorney General

- **20 approved** (through Meeting #13, April 2017)
 - Attorney General/DOJ decision to be made and issued within two NCFS meetings



Some Key NCFS Recommendations

Complete set of **43 work products** available at <https://www.justice.gov/ncfs/work-products-adopted-commission>

Work Products are Developed in **Subcommittees**:

- **Accreditation and Proficiency Testing**
 - Universal Accreditation
- **Interim Solutions**
 - Transparency of Quality Management System Documents
 - National Code of Professional Responsibility
- **Scientific Inquiry and Research**
 - Technical Merit Evaluation of FS Methods & Practice
- **Medicolegal Death Investigation**
 - National Disaster Call Center
- **Reporting and Testimony**
 - Use of the Term “Reasonable Scientific Certainty”
- **Training on Science and Law**
 - Forensic Science Curriculum Development

Recommendations to the Attorney General Regarding **Use of the Term “Reasonable Scientific Certainty”** (NCFS Approved 3/22/16)

- **Recommendation #1:** The Attorney General should direct all attorneys appearing on behalf of the Department of Justice (a) to forego use of these phrases when presenting forensic discipline testimony unless directly required by judicial authority as a condition of admissibility for the witness' opinion or conclusion, and (b) to assert the legal position that such terminology is not required and is indeed misleading.
- **Recommendation #2:** **The Attorney General should direct all forensic science service providers and forensic science medical providers employed by Department of Justice [FBI, DEA, and ATF Laboratories] not to use such language in reports or couch their testimony in such terms unless directed to do so by judicial authority.**
- **Recommendation #3:** The Attorney General should, in collaboration with NIST, urge the OSACs to develop appropriate language that may be used by experts when reporting or testifying about results or findings based on observations of evidence and data derived from evidence.

Attorney General Decision on NCFS Recommendation

- Department forensic laboratories [FBI, DEA, ATF] will review their policies and procedures to **ensure that forensic examiners are not using the expressions “reasonable scientific certainty” or “reasonable [forensic discipline] certainty” in their reports or testimony.** **Department prosecutors will abstain from use of these expressions** when presenting forensic reports or questioning forensic experts in court unless required by a judge or applicable law.

Attorney General Memo – September 6, 2016



Office of the Attorney General

Washington, D. C. 20530

September 6, 2016

MEMORANDUM FOR HEADS OF DEPARTMENT COMPONENTS

FROM:

THE ATTORNEY GENERAL

A handwritten signature in blue ink, reading "Loretta E. Lynch", is written over the text "THE ATTORNEY GENERAL".

SUBJECT:

Recommendations of the National Commission on Forensic Science;
Announcement for NCFS Meeting Eleven

As part of the Department's ongoing coordination with the National Commission on Forensic Science (NCFS), I am responding today to several NCFS recommendations to advance and strengthen forensic science. These recommendations involve promoting professional responsibility among forensic practitioners, instituting best practices in quality management of forensic laboratories, and advancing the relationship between academic forensic research and practical implementation.

Technical Merit Recommendations

(Approved by NCFS Sept 12, 2016)

- **Recommendation #1:** **NIST should establish an in-house entity** with the capacity to conduct independent scientific evaluations of the technical merit of test methods and practices used in forensic science disciplines.
- **Recommendation #2:** The **results of the evaluations will be issued by NIST as publicly available resource documents**. NIST's evaluation may include but is not limited to: **a) research performed by other agencies and laboratories, b) its own intramural research program, or c) research studies documented in already published scientific literature**. NIST should initially begin its work by piloting three resource documents to establish their design and requirements. The release of these documents should be broadly disseminated in the scientific and criminal justice communities and accompanied by judicial trainings.
- **Recommendation #3:** The Organization of Scientific Area Committees for Forensic Science (OSAC) leadership, the Forensic Science Standards Board (FSSB), should **commit to placing consensus documentary standards on the OSAC Registry of Approved Standards for only those forensic science test methods and practices where technical merit has been established** by NIST, or in the interim, established by an independent scientific body. An example of an interim independent scientific body could be an OSAC created Technical Merit Resource Committee composed of measurement scientists and statisticians appointed by NIST and tasked with the evaluation of technical merit.

Proposed NIST Plan to Meet NCFS Request

National Commission on Forensic Science
September 12, 2016
Technical Merit Review Panel

Proposed NIST Plan for Technical Merit Evaluations

Richard R. Cavanagh, Ph.D.

Director, Special Programs Office

National Institute of Standards and Technology



Showed and discussed 13 slides as part of a panel to NCFS on technical merit

Thoughts Related to Technical Merit Evaluation Request by NCFS

Some of the Questions Associated with Technical Merit

- **What is the scientific maturity of the underlying measurement, data, comparison, analysis?**
 - What has been published?
 - What has been reproduced?
 - What has been/is the level of discourse on the topic in the research community?
- **Is the approach widely adopted by Forensics Professionals?**
 - Is this an emerging approach?
 - Is this an established approach?
- **Have efforts been directed at establishing the repeatability, reproducibility and accuracy of the method within an organization and across organizations?**
 - Is there a statistical basis for understanding expectations of the test method or practice?
 - Is the confidence level in the test method or practice well documented?

NIST Pilot Plans for Technical Merit Evaluation

• Initial NIST efforts would look at three examples selected from different areas, as we learn if the approach can be effective:

- DNA
- Firearms
- Bitemarks

- **Seek input from a variety of experts:**
 - NIST-hosted workshop to develop criteria for evaluation prior to embarking on study of a forensic method or practice
- **Conduct a literature review:**
 - NIST librarians assist in curation of appropriate references covering the method or practice in question
 - Reference list will be publicly available as part of the study findings
- **Evaluation of literature claims:**
 - Identification of appropriate laboratory studies to test those claims
- **Conduct interlaboratory study(ies)**
 - Where possible, assess quality of work in operation – with de-identified participants
- **Publish findings and recommendations**
 - Possibilities include, *NIST Journal of Research*, *NIST Special Publication Series*, and other open access journals
- **Provide training for judges, lawyers, jurors, practitioners,...**
 - Develop training aids to convey the capabilities and limitations of studied forensic disciplines

Summary of Proposed NIST-Lab Technical Merit Efforts

- **Assessment focuses on scientific maturity of select aspects of three forensic science methods**
- **Assessment will look at and contribute to technical merit of current methods, including validation where feasible**
- **Assessment effort will not undertake original research**

1. DNA

- » Long history at NIST
- » Substantial resident expertise
- » Strong tradition of working with other agencies
- » New challenges with complex mixtures

2. Firearms and Toolmarks

- » Strong effort in applying image analysis
- » Strong effort in statistical analysis
- » Well integrated with practitioners.
- » Joint efforts currently underway with CSAFE

3. Bitemarks

- » NIST has expertise in Nano Indentation
- » NIST has expertise in characterization of Soft Materials
- » NIST would need to reach out to others
 - American Dental Association Foundation (ADA research effort at NIST for 88 years)

Commission Activities

(operates on 2-year renewal terms)

- Announcement at AAFS 2013 meeting on February 21, 2013
- Commission charter originally filed on April 23, 2013; renewed on April 23, 2015
- Commission membership announced on January 10, 2014
- Meetings held thus far:

- **Meeting 1 February 3 – 4, 2014**
- **Meeting 2 May 12 – 13, 2014**
- **Meeting 3 August 26 – 27, 2014**
- **Meeting 4 October 28 – 29, 2014**
- **Meeting 5 January 29 – 30, 2015**

Term 1

- **Meeting 6 April 30 – May 1, 2015**
- **Meeting 7 August 10 – 11, 2015**
- **Meeting 8 December 7 – 8, 2015**
- **Meeting 9 March 21 – 22, 2016**
- **Meeting 10 June 20 – 21, 2016**
- **Meeting 11 September 12 – 13, 2016**
- **Meeting 12 January 9 – 10, 2017**
- **Meeting 13 April 10 – 11, 2017**

Term 2

**NCFS Term 2 expired
April 23, 2017**

Wrap Up Comments from John Butler given on April 11, 2017 before the NCFS

Points of view are mine and do not necessarily represent the official position or policies of the US Department of Justice or the National Institute of Standards and Technology.

- Historical observations
- Personal reflections
- Lessons learned
- Acknowledgments



Lessons from History

- **Wilmer Souder** – National Bureau of Standards physicist who assisted in >800 cases for ~80 agencies from 1929 to 1953
- **1935 book “*Modern Criminal Investigation*”** (Harry Söderman & John O’Connell)
 - Chapter 29 “Police Laboratories” (p. 427)
“the personnel of the laboratory should be composed of detectives” with a “scientific advisor” to work “hand-in-hand” with “the detective heading the police laboratory”; **“This [scientific advisor] must be carefully chosen. Much depends on him.”**

Wilmer Souder is seen using an early comparison microscope to compare the rifling marks left on two bullets, a technique for determining whether the bullets were fired from the same gun. This technique for comparing bullets is still used today in much the same way. Credit: Photo by NBS/NIST; source: NARA

National Council of Public History (April 20): I am participating with FBI, DEA, and ATF Historians

Ideals for Firearms Identification

Wilmer Souder, *Army and Navy Journal*, March 19, 1932

Are we learning from history
or are we repeating it?

There should be adopted:

1. Minimum standards of equipment to be used.

OSAC efforts to prepare and promulgate documentary standards (moving very slowly)

2. Standards for records of evidence to accompany and substantiate the expert's opinion; these to include photographs, metrological data and interpretations in permanent form.

NCFS Views Document on Report and Case Record Contents (not approved 10 Apr 2017)

3. Standards for qualification of experts which will include actual tests made against secretly designated materials and reported in compliance with item 2.

PCAST requests for data to support all conclusions made (largely being ignored)

4. Methods for constant following up [with] experts testifying in court to guarantee the highest efficiency.

DOJ Forensic Science Discipline Review of FBI examiner testimony (just put on hold)

85 years later we are still addressing these same challenges!

Personal Reflections (1)

- My home was burglarized in June 2013 and **I have seen first-hand the challenges that exist in the criminal justice system beyond forensic science measurements**
 - e.g., sample collection problems by the detectives
- In April 2013, I moved within NIST to help with NCFS and other forensic activities
 - Leaving the laboratory environment has exposed me to a different “laboratory of learning”
 - I will likely be involved in helping with any future technical merit review & validation work conducted by NIST

Personal Reflections (2)

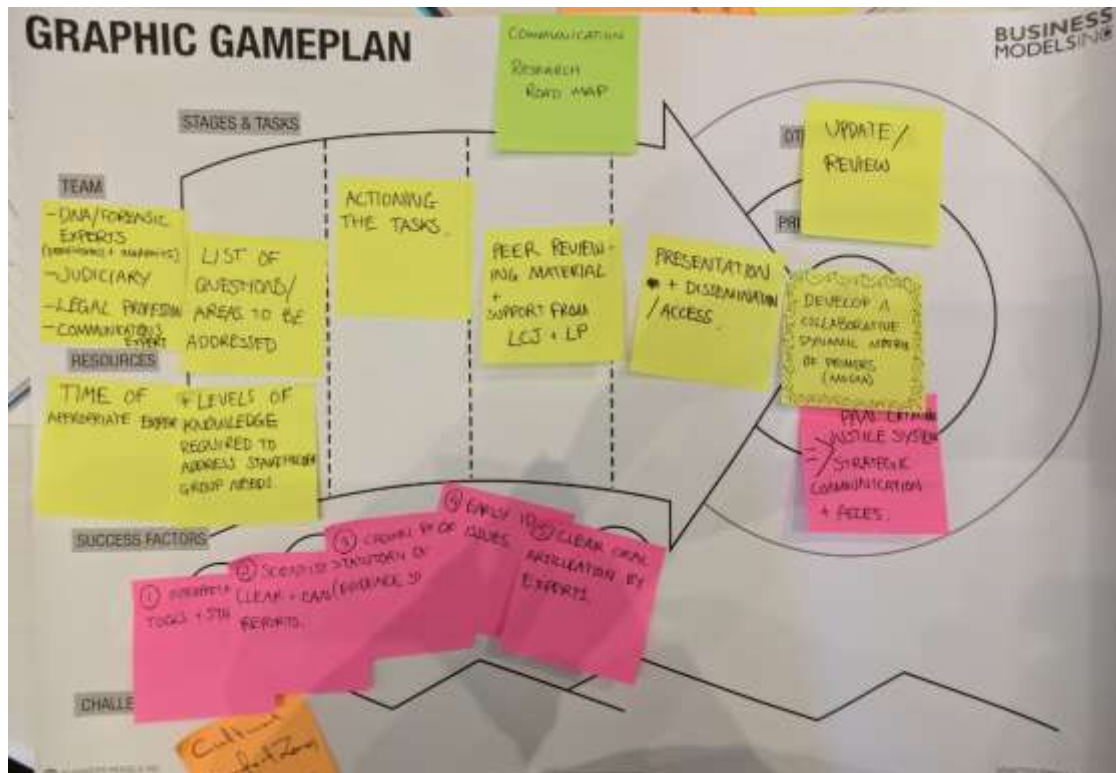
- I will go forward from my NCFS experience as an optimist with the belief that by small and simple things, great things can be brought to pass (but this may take longer than we would all like)
- With human nature **we are often quick to criticize**, but what will you and I do going forward to try and strengthen forensic science in the future?
- **I plan to continue writing articles, books, and conducting training** (when requested and available) of forensic practitioners, prosecutors, defense attorneys, and judges
- **Beyond the U.S.:** my experience in UK last week at the Royal Society
 - Diverse stakeholder perspectives are necessary to connect across disciplines and stakeholders – otherwise we live in silos and echo chambers

UK DNA Strategic Discussions

April 6-7, 2017 (London, UK)

- **Diverse perspectives are necessary to understand issues**
 - **Participants:** Judges (including head of the Judicial College), UK Regulator, laboratory director, forensic statistician, prosecutor, defense expert, academic researchers (multiple disciplines), documentary film maker, and a crime novelist (Val McDermid)
 - **Process:** business modeling process was used
- Training and communication are crucial to future improvements → action needs to be taken here

UK Strategic Planning on April 7, 2017 to Develop Stakeholder Primers



Goal to develop a matrix of collaborative and dynamic training primers (written and multi-media formats) to reach various stakeholders

An Illustrator was Present to Capture Our Discussions at this UK DNA Strategic Meeting



Commission → **a Unique Forum**

- NCFS has **enabled communication, collegiation, and collaboration** across various stakeholders to forensic science
- NCFS has benefited from the **openness and public input required** by Federal Advisory Committee Act (FACA) rules (*>600 public comments*)
- We live in an increasing polarized society (especially Washington, DC)
- There are unique challenges with forensic science operating in a legal adversarial environment
- I have personally enjoyed getting to know members of the Commission at our meetings and working collaboratively to understand one another and to reach consensus

The World Has Been Watching *What This Commission Is Doing*

WORLD VIEW

A personal take on events



Label the limits of forensic science

This week marks a chance to curb the misuse of crime-scene evidence in US courts and spare innocent people from going to jail, says Robin Mejia.

“Even good lawyers aren’t scientists, and right now prosecutors have an incentive to select forensic analysts who will assure juries that evidence is clear and convincing, not ones who will speak in appropriately cautious terms. Defense lawyers won’t necessarily recognize that there’s anything to refute in forensic evidence against their clients.”

Commission → **a Unique Classroom**

- Example: Paul Speaker's talk this morning
- **Topics covered:** accreditation, human factors & cognitive bias, ethics, standards development, digital evidence, evidence retention & storage, training & continuing education, research, statistics, ...
- **140 invited speakers** in 13 meetings

See meeting videos available at

<https://www.nist.gov/topics/forensic-science/national-commission-forensic-science>

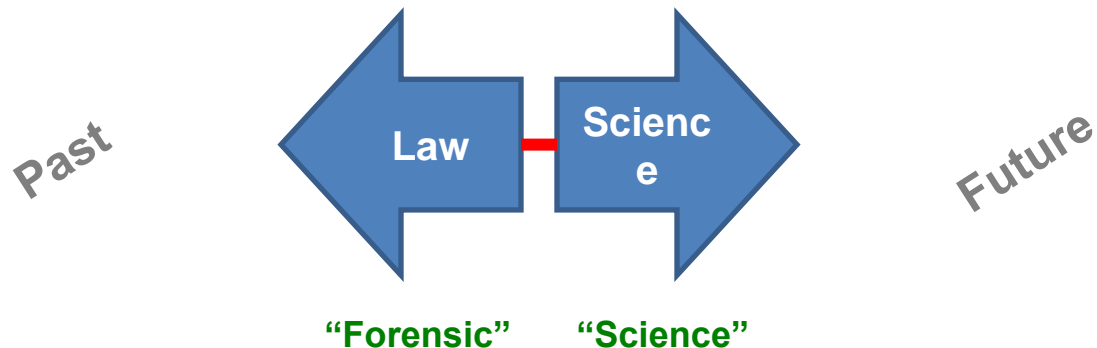
Important Observations

- The National Research Council 2009 (“**NAS Report**”) **called for changes** to strengthen forensic science (with 13 recommendations) but these are not really new issues
- **The criminal justice system**, where forensic science only plays a small part, **is not perfect**; there have been individuals wrongly convicted for a variety of reasons
- Despite a few well-publicized examples (e.g., Annie Dookhan), **forensic scientists** generally want to do a good job and **are trying to do their best**
- **Many forces are at play** to either change things or to maintain the status quo → ***which changes are needed?***

Culture Clash: Science and Law

Tension exists between science and the law:

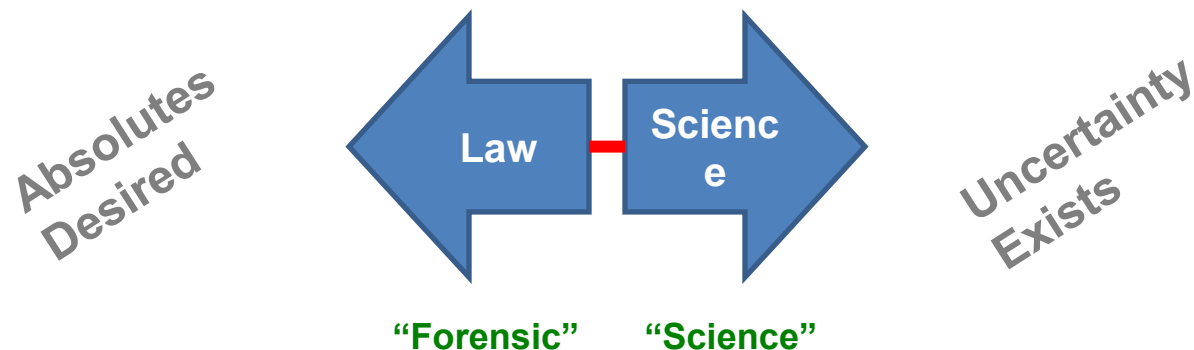
- The legal community **looks to the past**
(precedence is desired)
- The scientific community **looks to the future**
(evolving improvement is desired)



Culture Clash: Science and Law

Tension exists between science and the law:

- The legal community **wants finality and absolutes** (guilty or not-guilty court decisions)
- The scientific community **operates without certainty** (rarely with probabilities of 0 or 1)



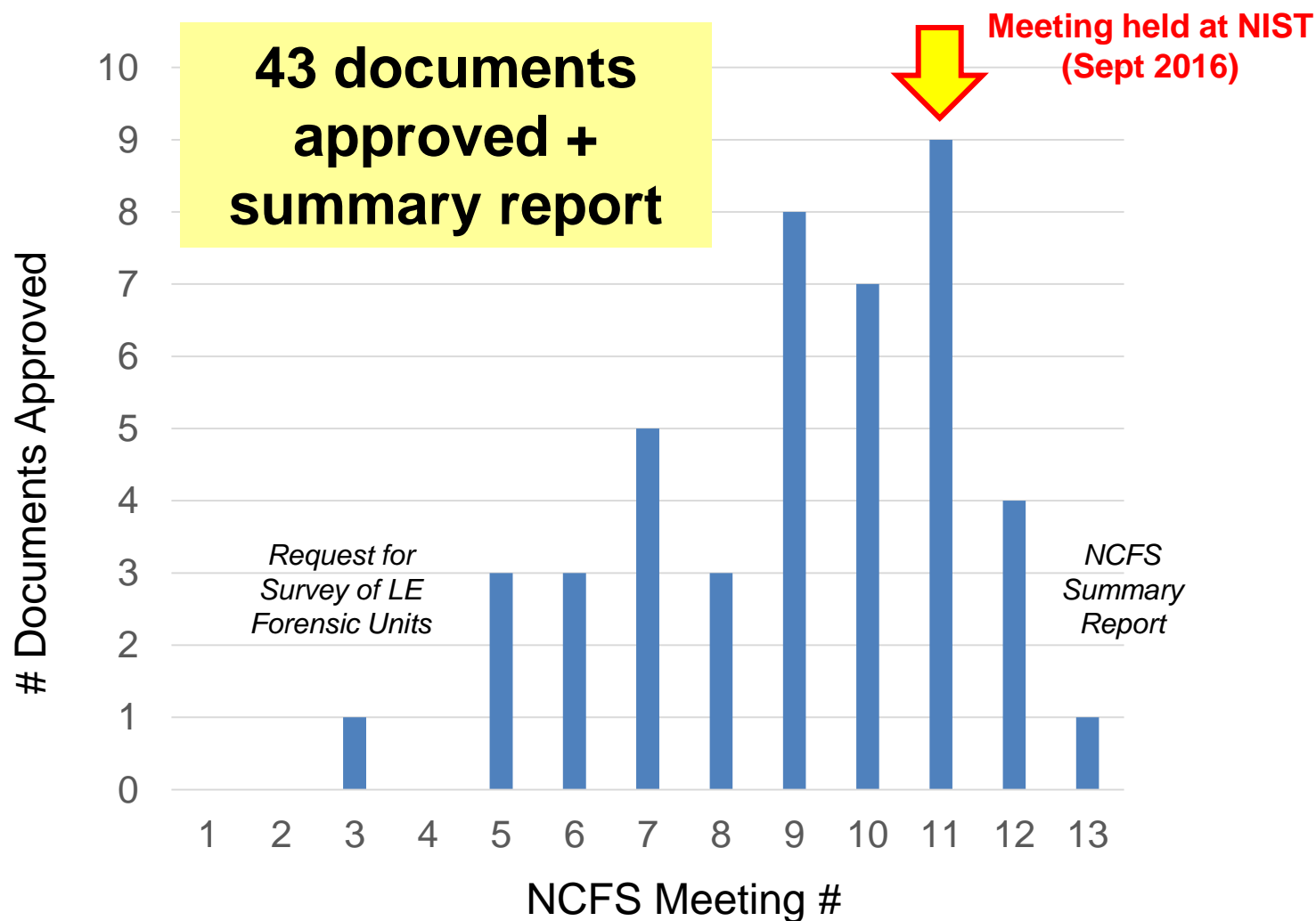
Challenges to Communicating

- People like **narratives** better than **numbers**
 - **can we communicate science concepts correctly?**
- **We often talk past each other** (forensic practitioners & lawyers or practitioners & academic scientists) because we do not appreciate a subtle or significant difference in the meaning of a word or phrase – ***need for uniform terminology***
- “A reasonable degree of scientific certainty...”
 - **I believe this is a legal crutch that has no scientific meaning and should not be used in court**

Lessons Learned

1. **Time and patience** are required for a newly organized group to align, pull together, and “gel”
2. **Respect and trust** involves listening to and seeking to understand the perspectives of others
3. **Receiving feedback can be uncomfortable** but in the end usually helps improve our efforts
4. **The community benefits when a dedicated group works together** and is open with its work products

Challenge of Ramping Up Activities and Impact of Ramping Down



NCFS Acknowledgments

- **Commissioners** (**49 in total across two terms**), meeting proxies, and subcommittee members (7 subcommittees + SPO; $15+17+1+7+10+4+6 = 60$ **additional SC members**)
- **Invited presenters** ($8+7+10+6+8+15+4+8+7+12+10+17+28 = 140$)
- NIST leadership support
 - Pat Gallagher, **Willie May**, Kent Rochford, Rich Cavanagh
- DOJ leadership support
 - **Nelson Santos, my fellow Vice-Chair**
 - DAG James Cole, DAG Sally Yates
 - OLP: Kira Antell, Alex Krulic, Shimica Gaskins, Jonathan Wroblewski
- NCFS staff support
 - **DFO: Jonathan McGrath**, Andrew Bruck, Brette Steele, Armando Banilla (pre-NCFS initiation)
 - **Lindsay DePalma**, Danielle Weiss, Victor Weedn, Robin Jones
 - Contractor support with note taking at public meetings and subcommittee meetings and webcasts
 - Meeting logistics and planning people at OJP, NIST, and House of Sweden

Organization of Scientific Area Committees (OSAC)

Forensic discipline-specific “guidance groups” administered by NIST



NIST
**National Institute of
Standards and Technology**
U.S. Department of Commerce

<https://www.nist.gov/topics/forensic-science/organization-scientific-area-committees-osac>



>600 people involved in 34 operational units
<http://www.nist.gov/forensics/osac/index.cfm>

- Provides technical leadership to help develop and promulgate **consensus-based documentary standards and guidelines** for forensic science
- Promotes standards and guidelines that are **fit-for-purpose** and **based on sound scientific principles**
- Promotes the use of OSAC documents by accreditation and certification bodies
- Establishes and maintains working relationships with similar organizations

OSAC held an in-person meeting April 18-21, 2017 in Leesburg, Virginia

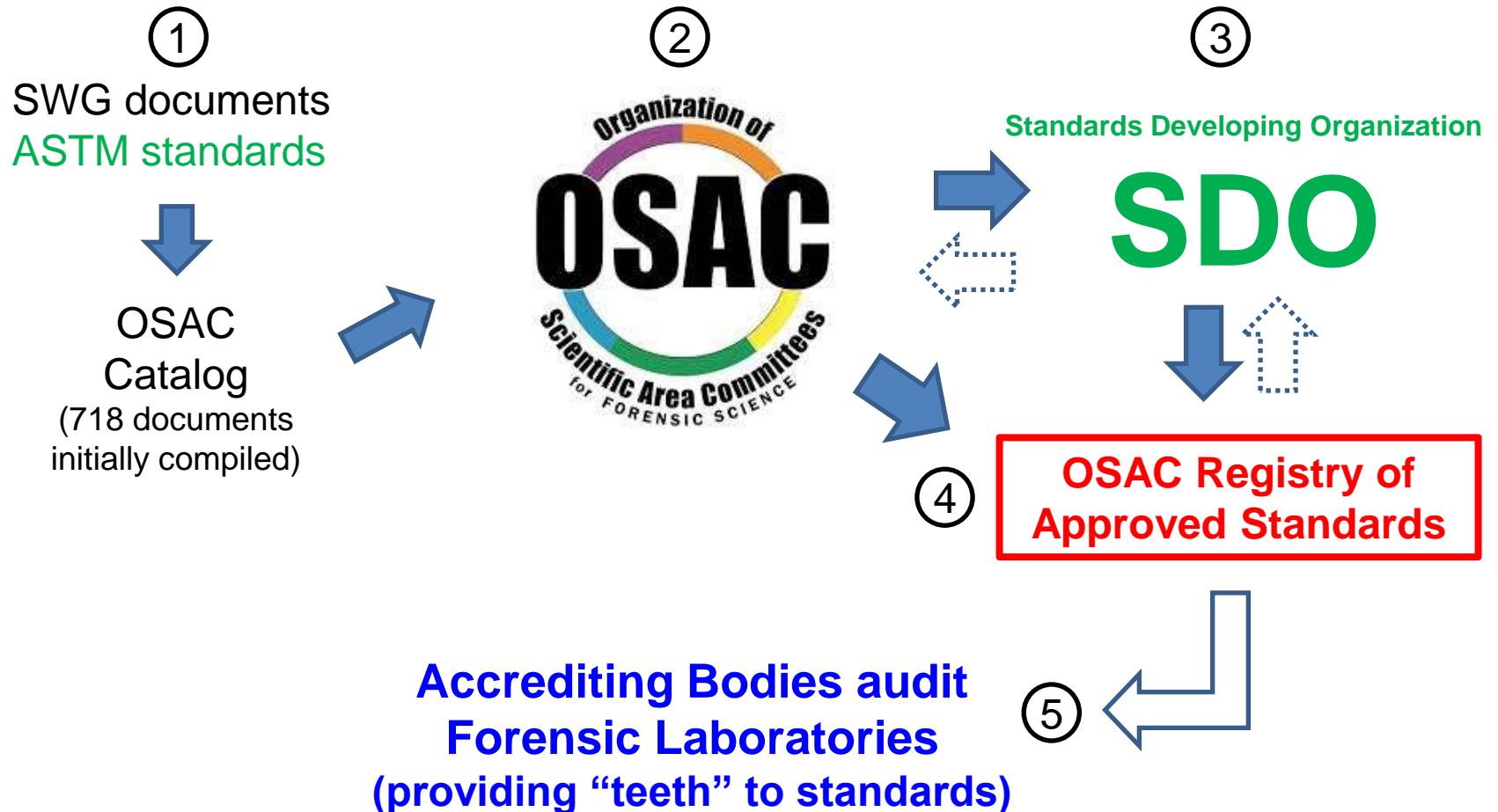
OVERALL GOAL of OSAC REGISTRY:

*Provide trusted discipline-specific standards (and guidelines)
that accrediting bodies can use to audit accredited laboratories*

***Provides initial
starting material***

***Creates high-quality
guidance materials***

***Turns OSAC materials
into standards***



OSAC Monthly Newsletter

A communication vehicle to improve interaction with stakeholders



One of the ways to solicit public comment on standards and guidelines up for consideration on the OSAC Registries

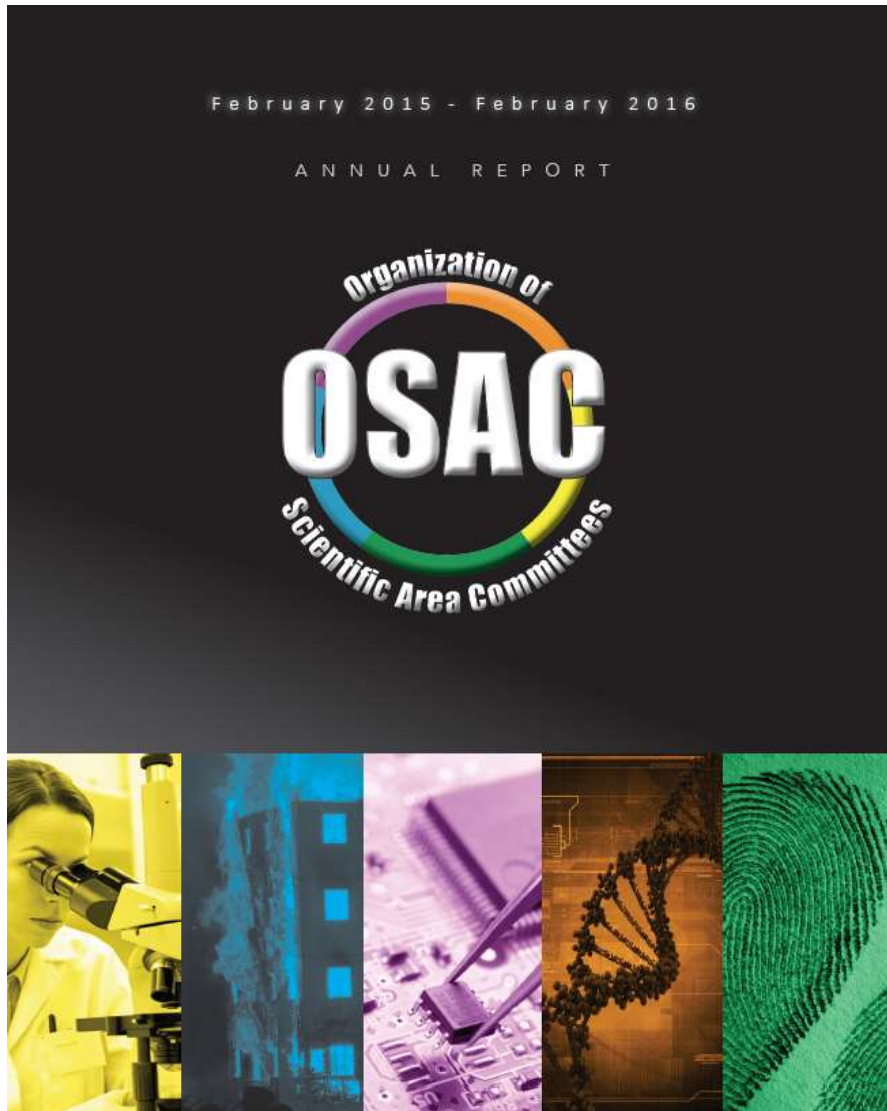
Issues (to-date)

- August 2015
- September 2015
- October 2015
- November 2015
- December 2015
- January 2016
- February 2016
- March 2016
- April 2016
- May 2016
- June 2016
- July 2016
- August 2016
- September 2016
- October 2016
- November 2016
- December 2016
- January 2017
- February 2017
- March 2017
- April 2017

Newsletters released around 15th of each month

<https://www.nist.gov/topics/forensic-science/osac-newsletter>

OSAC Annual Report



- **74 page report** summarizing activities from the first year of OSAC (Feb 2015 to Feb 2016)
- Available as a pdf file for download at https://www.nist.gov/sites/default/files/documents/2016/09/13/osac_annual_report_2015-2016.pdf

See also Public Status Meetings (Feb 2017):
<https://www.nist.gov/news-events/events/2017/02/osac-scientific-area-committees-public-status-reports-open-discussions>

Released 19 September 2016

NIST Center of Excellence on Forensic Science



CSAFE will focus on the following objectives: <http://forensic.stat.iastate.edu/>

- **Develop and apply statistical methods** to pattern evidence, including latent prints, handwriting, tool marks, computer and information systems, social media, and GPS
- **Develop**, in collaboration with NIST scientists, **new methods for forensic evidence**
- **Develop new inference techniques that account for various sources of uncertainty**
- **Establish a sound base of interpretation for forensic evidence** in judicial settings
- **Educate and train forensic practitioners, judges and attorneys**, and the next generation of statisticians

First Forensic Science Error Management Meeting was Held in July 2015



- **432 registered participants from 11 countries**
- Over the 3.5-day meeting and across 8 technical tracks and 42 sessions, **there were 2 keynote and 10 plenary speakers, 106 oral presentations, 9 panel discussions, and 18 poster presentations.**
- In their keynote address, Brandon Mayfield, a victim of a forensic science error, and Steven Wax, Mr. Mayfield's attorney, providing a gripping tale of the impact that an error in a fingerprint "match" caused Mr. Mayfield and his family (see video at <https://www.nist.gov/associate-director-laboratory-programs/recorded-sessions>)

Proceedings published from the first Error Management meeting (download using link below)

<http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1206.pdf>

July 24-28, 2017

NIST
National Institute of
Standards and Technology
U.S. Department of Commerce



**FORENSIC SCIENCE
ERROR MANAGEMENT**

**INTERNATIONAL
FORENSICS SYMPOSIUM**

July 24-28, 2017 @NIST, Gaithersburg, MD



Crime Scene - Death Investigation
Human Factors - Legal Factors
***Quality Assurance - Laboratory
Management***
Criminalistics - Digital Evidence

<https://www.nist.gov/news-events/events/2017/07/2017-international-forensic-science-error-management-symposium>

National Commission on Forensic Science (NCFS):
www.justice.gov/ncfs

Organization of Scientific Area Committees (OSAC):
www.nist.gov/forensics/osac/index.cfm



www.nist.gov/forensics



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